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We here have the key to Mr. Wiley's method; for by the *second principle* q_1 is known at a glance, and by the third principle r_2 is found by equation (1); whence q_2 becomes known from (1'), and q_3, q_4 , &c., are successively found from equations (2'), (3'), &c.

(To be continued.)

PROBLEMS.

1. Find the value of x and y in the following equations:

$$a^2 x^4 + b^2 y^4 = a^2 b^2 (x + y)^2;$$

$$a^2 x^2 + b^2 y^2 = a^2 b^2.$$

—Communicated by U. JESSE KNISELY, Pres't and Prof. of Mathematics in *Luther College*, Newcomerstown, Ohio.

2. Let a regular polygon of 14 sides be described, each of whose equal sides shall be *one*. Then will the radius of its circumscribing circle, which put= r , be more than *two* and less than *three*. Put $r=2+x$; then is x a positive quantity less than *one*. Let another regular polygon of half the number of sides (7) be inscribed in a circle whose radius is *one*, and determine one of its equal sides in functions of x expressed in its simplest form.

3. If a line make an angle of 40° with a fixed plane, and a plane embracing this line be perpendicular to the fixed plane, how many degrees from its first position must the plane embracing the line revolve in order that it may make an angle of 45° with the fixed plane?—Communicated by PROF. A. SCHUYLER, Berea, Ohio.

4. A cask containing a gallons of wine stands on another containing a gallons of water; they are connected by a pipe, through which, when open, the wine can escape into the lower cask at the rate of c gallons per minute, and through a pipe in the lower cask the mixture can escape at the same rate; also, water can be let in through a pipe on the top of the upper cask at a like rate. If all the pipes be opened at the same instant, how much *wine* will be in the lower cask at the end of t minutes, supposing the fluids to mingle perfectly?—Communicated by ARTEMAS MARTIN, Mathematical Editor of *Schoolday Magazine*, Erie, Pa.

NOTE.—To those who use "Nystrom's Mechanics:" Nystrom prints

$$"\pi^2=9.869650000+,"$$

$$\text{but } \pi^2=9.86960440108+.\text{—U. JESSE KNISELY.}$$